

What is claimed is:

- 1 1. An isolated DNA molecule comprising a DNA
2 sequence encoding a polypeptide with a first amino acid
3 sequence selected from the group consisting of the amino
4 acid sequences of the polypeptides MTBN1, MTBN2, MTBN3,
5 MTBN4, MTBN5, MTBN6, MTBN7, and MTBN8, as depicted in
6 Fig. 1,
7 or a second amino acid sequence identical to said
8 first amino acid sequence with conservative
9 substitutions,
10 wherein said polypeptide has *Mycobacterium*
11 *tuberculosis* specific antigenic and immunogenic
12 properties.
- 1 2. An isolated portion of the DNA molecule of
2 claim 1, said portion encoding a segment of said
3 polypeptide shorter than the full-length polypeptide,
4 said segment having *Mycobacterium tuberculosis* specific
5 antigenic and immunogenic properties.
- 1 3. A vector comprising:
2 (a) the DNA molecule of claim 1; and
3 (b) transcriptional and translational regulatory
4 sequences operationally linked to said DNA sequence, said
5 regulatory sequences allowing for expression of the
6 polypeptide encoded by said DNA sequence in a cell.
- 1 4. A vector comprising:
2 (a) the DNA molecule of claim 2; and
3 (b) transcriptional and translational regulatory
4 sequences operationally linked to said DNA sequence, said
5 regulatory sequences allowing for expression of the
6 polypeptide encoded by said DNA sequence in a cell.
- 1 5. A cell transformed with the vector of claim 3.
- 1 6. A cell transformed with the vector of claim 4.

2 7. A composition comprising the vector of claim 3
3 and a pharmaceutically acceptable diluent or filler.

1 8. A composition comprising the vector of claim 4
2 and a pharmaceutically acceptable diluent or filler.

1 9. A composition comprising at least two DNA
2 sequences, each encoding a polypeptide of the
3 *Mycobacterium tuberculosis* complex that is not a
4 polypeptide encoded by the genome of cells of the Bacille
5 Calmette Guerin (BCG) strain of *Mycobacteria bovis*, said
6 DNA sequences being operationally linked to
7 transcriptional and translational regulatory sequences
8 which allow for expression of each said polypeptide in a
9 cell of a vertebrate,
10 wherein at least one of said DNA sequences is a
11 DNA molecule of claim 1.

1 10. A composition comprising at least two DNA
2 sequences, each encoding a functional fragment of a
3 polypeptide of the *Mycobacterium tuberculosis* complex,
4 said DNA sequences being operationally linked to
5 transcriptional and translational regulatory sequences
6 which allow for expression of each said polypeptide in a
7 cell of a vertebrate,
8 wherein at least one of said DNA sequences is a
9 DNA molecule of claim 2.

1 11. An isolated polypeptide with a first amino
2 acid sequence selected from the group consisting of the
3 sequences of the polypeptides MTBN1, MTBN2, MTBN3, MTBN4,
4 MTBN5, MTBN6, MTBN7, and MTBN8, as depicted in Fig. 1,
5 or a second amino acid sequence identical to said
6 first amino acid sequence with conservative
7 substitutions,
8 wherein said polypeptide has *Mycobacterium*
9 *tuberculosis* specific antigenic and immunogenic
10 properties.

1 12. An isolated segment of the polypeptide of
2 claim 11, said segment being shorter than the full-length
3 polypeptide and having *Mycobacterium tuberculosis*
4 specific antigenic and immunogenic properties.

1 13. A composition comprising the polypeptide of
2 claim 11 and a pharmaceutically acceptable diluent or
3 filler.

1 14. A composition comprising a functional
2 fragment of the polypeptide of claim 12 and a
3 pharmaceutically acceptable diluent or filler.

1 15. A composition comprising at least two
2 polypeptides of the *Mycobacterium tuberculosis* complex,
3 each polypeptide not being encoded by the genome of the
4 cells of the BCG strain of *Mycobacterium bovis*, wherein
5 at least one of said polypeptides is a polypeptide of
6 claim 1.

1 16. A composition comprising functional fragments
2 of at least two polypeptides of the *Mycobacterium*
3 *tuberculosis* complex, each polypeptide not being encoded
4 by the genome of cells of the Bacille Calmette Guerin
5 (BCG) strain of *Mycobacteria bovis*, wherein at least one
6 of said polypeptides is a segment of claim 2.

1 17. A method of diagnosis comprising:
2 (a) administration of the composition of claim 15
3 to a subject suspected of having or being susceptible to
4 *Mycobacterium tuberculosis* infection; and
5 (b) detecting an immune response in said subject
6 to said composition as an indication that said subject
7 has or is susceptible to *Mycobacterium tuberculosis*
8 infection.

1 18. A method of diagnosis comprising:

2 (a) administration of the composition of claim 16
3 to a subject suspected of having or being susceptible to
4 *Mycobacterium tuberculosis* infection; and

5 (b) detecting an immune response in said subject
6 to said composition as an indication that said subject
7 has or is susceptible to *Mycobacterium tuberculosis*
8 infection.

1 19. A method of diagnosis comprising:

2 (a) providing a population of cells comprising CD4
3 T lymphocytes from a subject;

4 (b) providing a population of cells comprising
5 antigen presenting cells (APC) expressing a major
6 histocompatibility complex (MHC) class II molecule
7 expressed by said subject;

8 (c) contacting the CD4 lymphocytes of (a) with the
9 APC of (b) in the presence of the polypeptide of claim
10 12; and

11 (d) determining the ability of said CD4
12 lymphocytes to respond to said polypeptide, as an
13 indication that said subject has or is susceptible to
14 *Mycobacterium tuberculosis* infection.

1 20. A method of diagnosis comprising:

2 (a) providing a population of cells comprising CD4
3 T lymphocytes from a subject;

4 (b) providing a population of cells comprising
5 antigen presenting cells (APC) expressing at least one
6 major histocompatibility complex (MHC) class II molecule
7 expressed by said subject;

8 (c) contacting the CD4 lymphocytes of (a) with the
9 APC of (b) in the presence of the segment of claim 12;
10 and

11 (d) determining the ability of said CD4
12 lymphocytes to respond to said polypeptide, as an

13 indication that said subject has or is susceptible to
14 *Mycobacterium tuberculosis* infection.

1 21. A method of diagnosis comprising:

2 (a) providing a population of cells comprising CD4
3 T lymphocytes from a subject;

4 (b) providing a population of cells comprising
5 antigen presenting cells (APC) expressing at least one
6 major histocompatibility complex (MHC) class II molecule
7 expressed by said subject;

8 (c) contacting the CD4 lymphocytes of (a) with the
9 APC of (b) in the presence of the composition of claim
10 15; and

11 (d) determining the ability of said CD4
12 lymphocytes to respond to said polypeptide, as an
13 indication that said subject has or is susceptible to
14 *Mycobacterium tuberculosis* infection.

1 22. A method of diagnosis comprising:

2 (a) providing a population of cells comprising CD4
3 T lymphocytes from a subject;

4 (b) providing a population of cells comprising
5 antigen presenting cells (APC) expressing at least one
6 major histocompatibility complex (MHC) class II molecule
7 expressed by said subject;

8 (c) contacting the CD4 lymphocytes of (a) with the
9 APC of (b) in the presence of the composition of claim
10 16; and

11 (d) determining the ability of said CD4
12 lymphocytes to respond to said polypeptide, as an
13 indication that said subject has or is susceptible to
14 *Mycobacterium tuberculosis* infection.

1 23. A method of diagnosis comprising:

2 (a) contacting the polypeptide of claim 11 with a
3 bodily fluid of a subject;

4 (b) detecting the presence of binding of antibody
5 to said polypeptide, as an indication that said subject
6 has or is susceptible to *Mycobacterium tuberculosis*
7 infection.

1 24. A method of diagnosis comprising:

2 (a) contacting the segment of claim 12 with a
3 bodily fluid of a subject;

4 (b) detecting the presence of binding of antibody
5 to said polypeptide, as an indication that said subject
6 has or is susceptible to *Mycobacterium tuberculosis*
7 infection.

1 25. A method of diagnosis comprising:

2 (a) contacting the composition of claim 15 with a
3 bodily fluid of a subject;

4 (b) detecting the presence of binding of antibody
5 to said composition, as an indication that said subject
6 has or is susceptible to *Mycobacterium tuberculosis*
7 infection.

1 26. A method of diagnosis comprising:

2 (a) contacting the composition of claim 16 with a
3 bodily fluid of a subject;

4 (b) detecting the presence of binding of antibody
5 to said composition, as an indication that said subject
6 has or is susceptible to *Mycobacterium tuberculosis*
7 infection.

1 27. A method of vaccination comprising

2 administration of the composition of claim 7 to a
3 subject.

1 28. A method of vaccination comprising

2 administration of the composition of claim 8 to a
3 subject.

1 29. A method of vaccination comprising
2 administration of the composition of claim 9 to a
3 subject.

1 30. A method of vaccination comprising
2 administration of the composition of claim 10 to a
3 subject.

1 31. A method of vaccination comprising
2 administration of the composition of claim 13 to a
3 subject.

1 32. A method of vaccination comprising
2 administration of the composition of claim 14 to a
3 subject.

1 33. A method of vaccination comprising
2 administration of the composition of claim 15 to a
3 subject.

1 34. A method of vaccination comprising
2 administration of the composition of claim 16 to a
3 subject.